REMARKS

Status of the Claims

Claims 1-7 are pending in this application. No claims have been canceled, added or amended. Applicants amend the specification to replace page 25 with a new page 25 in order to amend Table 1 to change "Example 3" to "Comparative Example 1". Support for this amendment is found at page 23 under Comparative Example 1. No new matter has been added by the above specification amendment.

Rejection under 35 US 103(a)

The Examiner rejects claims 1-7 as obvious over US Patent 5,348,990 to Walpita et al. (Walpita '990) in view of US Patent 5,308,892 to Zickler et al. (Zickler '892) and US Patent 5,541,240 to Makhija et al. (Makhija '240). Applicants traverse the rejection and respectfully request the withdrawal thereof.

The present invention is directed to a process for producing a thermoplastic resin composition, wherein a melt-kneading extruder equipped with a screw is used in the process. The extruder has an upper stream side supplying portion at the upper stream part of the extrusion direction, and a lower stream side supplying portion at the lower stream part from said upper stream side supplying portion. The ratio (L/D) of the distance (L) between the upper

stream side supplying portion and the lower stream side supplying portion to the diameter (D) of the screw is 4-30 (L and D are the same scale units). Under screw rotation, a thermoplastic resin having a specific gravity of 1.10 or more is supplied from the upper stream side supplying portion, and hollow spheres in an amount of 2-50 parts by weight based on 100 parts by weight of the thermoplastic resin are supplied from the lower stream side supplying portion.

Walpita '990 discloses a process for making liquid crystal polyester by mixing 6-10% by weight hollow glass bubbles or spheres, 30% by weight PTFE and 60-64% by weight of repeating units derived from 4-hydroxybenzoic acid and 6-hydroxy-2-naphthoic acid. See Tables 1 and 2 of Walpita '990. The glass bubbles or spheres are added into the mixture with the rest of the components using a HAA-KE™ melt mixer at about 362°C. See column 3, lines 40-55. The process of Walpita '990 fails to disclose adding hollow spheres in an amount of 2-50 parts by weight based on 100 parts by weight of the thermoplastic resin, which is supplied from the lower stream side supplying portion of the extruder.

The Examiner relies on Zickler '892 and Makhija '240 for allegedly disclosing a process for making liquid crystal polyester where fragile fillers, such as hollow spheres are added to the mixture from a lower part of a twin screw extruder. The Examiner

contends that this method of adding the fragile fillers is commonly known in the art.

Applicants submit that Zickler '892 discloses a process for making a polyester masterbatch containing thermoplastic polyesters, additives, such as glass powder, where the additives are added to the mixture by a single screw or multiple screw homogenizing extruded having a feed end and a discharge end, kneading zones, at least two feed in points, and at least one degassing opening. See column 2, lines 37 to 59. Zickler '892 fails to disclose adding hollow spheres in an amount of 2-50 parts by weight based on 100 parts by weight of the thermoplastic resin, where the hollow spheres are supplied from the lower stream side supplying portion of the extruder.

Makhija '240 is directed to a method for making a blend of a thermotropic liquid crystalline polymer and a melt-processable isotropic polymer. In the process, a stream of either the thermotropic liquid crystalline polymer or the isotropic polymer is extruded in a molten state through a heated zone under conditions where the polymer component is sheared. The other polymer component is added to the stream of molten polymer being extruded through the heated mixing zone to mix the two polymers. Filled blends, such as glass fibers and fillers may be added through the

second port of the extruder along with the second polymer. See column 1, lines 30-63 and column 4, lines 11-13.

Makhija '240 fails to disclose adding hollow spheres in an amount of 2-50 parts by weight based on 100 parts by weight of the thermoplastic resin and where the hollow spheres are supplied from the lower stream side supplying portion of the extruder.

Applicants submit that the Examiner has failed to establish a prima facie case of obviousness. The combination of the references fails to disclose all the elements of the present invention pursuant to MPEP 2143 and MPEP 2143.01. Moreover, Applicants submit that there is no motivation in the cited references or in the general body of knowledge within the field of art for one of ordinary skill in the art to modify Walpita '990 to include adding hollow spheres in an amount of 2-50 parts by weight based on 100 parts by weight of the thermoplastic resin to the mixture from the lower stream side supplying portion of the extruder.

The Examiner equates hollow glass bubbles or spheres of Walpita '990, with glass powder of Zickler '892 and glass fibers of Makhija '240. The Examiner further asserts that one of ordinary skill in the art would make the Walpita '990 composition by the methods described in Zickler '892 and Makhija '240. The Examiner also seems to equate the glass powder and

glass fiber from the prior art with hollow spheres of the present invention. Applicants submit that hollow spheres are different from glass powder or glass fiber. There is no suggestion that they are interchangeable.

See for example, Table 1 of the present specification where Examples 1 and 2 have hollow spheres according to the present invention feed into the extruder according to the present invention at the lower portion of the extruder. The resulting composition has low specific gravity and a low breakdown rate regardless of which portion the hollow spheres were fed. On the other hand, looking at Comparative Example 1 in Table 1, if hollow spheres are fed from the upper portion, the obtained composition fails to have the superior properties of the present invention.

As such, one of ordinary skill in the art would not be motivated to combine the method described in Zickler '892 with the method described in Walpita '990 to arrive at the present invention, since Zickler '892 does not specify that the glass filler must be added through the lower portion of the extruder.

Also, one would not be motivated to combine Walpita '990 with Makhija '240, since Makhija '240 discloses adding the glass filler with either the thermotropic liquid crystalline polymer

or the isotropic polymer, unlike in Walpita '990 where all of the components are added together.

Assuming that some motivation does exist to combine the references, Applicants submit that at best, one of ordinary skill in the art would only be motivated to feed glass fiber into the lower portion of the extruder, which still falls short of the present invention since glass fiber is not equivalent to hollow spheres and there is no motivation to use hollow spheres as recited in the present invention.

Moreover, none of the references discloses or suggests the claim element of the specific L/D ratio of 4-30 between the upper stream side supplying portion and the lower stream side supplying portion to the diameter (D) of the screw (L and D are the same scale units).

In light of above stated inconsistent features between the references and the references failure to disclose all the elements of the present invention, Applicants submit that no prima facie case of obviousness has been established.

Conclusion

As Applicants have addressed and overcome all rejections in the Office Action, Applicants respectfully request that the rejections be withdrawn and that the claims be allowed.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Kecia Reynolds (Reg. No. 47,021) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s)